

RESPONSE

This paper is presented in response to the Examiner's Office Action mailed January 9, 2003. In light of the election made herein to prosecute the invention of Group 1, drawn to an apparatus comprising an integral cathode, claims 1-22 and claims 28-56 are now pending in this application.

Reconsideration of this application is respectfully requested in view of the following remarks. For the convenience and reference of the Examiner, the remarks of the Applicant are presented in the order in which the corresponding issues were raised in the Office Action.

I. Election of Claims

Applicant hereby affirms the provisional election, made during the Wednesday, December 11, 2002 telephone conversation between Eric L. Maschoff and the Examiner, to prosecute the invention of Group 1, drawn to an apparatus comprising an integral cathode as recited in claims 1-22 and 28-56.

II. Claim Rejections Under 35 U.S.C. § 103(a)

In connection with the matters contemplated herein, Applicant respectfully notes at the outset that the following discussion should not be construed to constitute an exhaustive enumeration of the distinctions between the claims of the present application and the references cited by the Examiner. Instead, such distinctions are presented solely by way of example. Consistent with the foregoing, the discussion herein is not intended, and should not be construed, to prejudice or foreclose future consideration, by the Applicant, of additional or alternative

distinctions between the claims of the present application and the references cited by the Examiner.

With specific reference to the obviousness rejections posed by the Examiner, Applicant respectfully notes that in order to establish a *prima facie* case of obviousness, it is the burden of the Examiner to demonstrate that three criteria are met: first, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; second, there must be a reasonable expectation of success; and third, the prior art reference (or references when combined) must teach or suggest all the claim limitations. *See* M.P.E.P. § 2143.

The Examiner has rejected claims 1-3, 5-18 and 28-56 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,264,801 issued to *DeCou, Jr. et al.* (“*DeCou*”), in view of U.S. Patent No. 4,739,214 issued to *Barr* (“*Barr*”). Additionally, the Examiner has rejected claim 4 and claims 19-22 under 35 U.S.C. § 103(a) as being unpatentable over *DeCou* and *Barr*, in view of U.S. Patent No. 5,515,413 issued to *Knudsen et al.* (“*Knudsen*”). For at least the reasons outlined below however, Applicant respectfully disagrees with the contentions of the Examiner.

A. Rejection of Independent Claim 1

As noted above, the Examiner has rejected independent claim 1, as well as claims 2 and 3 depending therefrom, as being unpatentable over *DeCou*, in view of *Barr*. In posing such rejection, the Examiner concedes that “*DeCou Jr. et al.* do not explicitly disclose an emitter having a predetermined geometrical configuration oriented to cause at least some of the discharged electrons to converge to a focal spot” (emphasis added) but suggests that “*Barr* discloses an emitter (16) having a predetermined geometrical configuration oriented to cause at

least some of the discharged electrons to converge at a focal spot” and further, that “Barr teaches that the shape of the emitter enables electrons emitted from respective portions of the emitting surface (18) to converge to a focal spot while maintaining uniform electron emission.”

The Examiner then concludes that “It would have been obvious to modify the apparatus of DeCou, Jr. et al. such that it incorporated an emitter possessing a predetermined geometrical configuration” and, in that regard, that “one would have been motivated to make such a modification so that energetic loss due to erratic electron propagation is minimized and the full power of thermionic emissions are realized, by way of focused radiation as taught by Barr” (emphasis added).

However, Figure 1 of *DeCou* clearly indicates that while electrons emitted from the filament 12 are somewhat dispersed initially, such electrons are subsequently focused into an electron beam 16 that is directed toward a focal spot 18 on a tungsten track 20 of a target. See also, col. 2, lines 61-65. Since the *DeCou* device is already configured to focus the electrons that are emitted from the filament, no advantage would be realized by modifying the *DeCou* device to include the emitter disclosed in *Barr*. In view of the foregoing, it is clear that there is, in fact, no motive to modify *DeCou* in the manner suggested by the Examiner because the functionality attributed to the *Barr* emitter by the Examiner, that is, the ability to focus emitted electrons, is already present in the *DeCou* device. Consistently, the *DeCou* reference fails to suggest such a combination and, as discussed below, *Barr* likewise fails to suggest such a combination.

For example, while *Barr* discloses a cathode 16 in the form of a sector of a sphere (col. 2, lines 56-57), the type of cathode disclosed in *Barr* is materially different from the type of cathode employed by the *DeCou* device. With respect first to the *DeCou* device, the Examiner has noted that “transmission of power from said power source to said emitter causes said emitter

to discharge electrons” (emphasis added), and has further stated that the allegedly obvious combination stems from a motive to realize the “full power of thermionic emissions” (emphasis added). In contrast, *Barr* states that “a principle object of the invention is to adapt cold cathode electron emission techniques to the sourcing of electrons” (emphasis added), col. 2, lines 13-15, and discloses that, with respect to the operation of such cold cathodes “cathode discharge initiation is brought about by the creation of a small plasma discharge in the cathode chamber” (emphasis added). Col. 4, lines 25-29.

Consistent with its focus on the use of cold cathodes for electron emission, *Barr* provides no guidance as to whether it would be desirable, or even possible, to modify the cold cathode 16 for use in an x-ray device such as the *DeCou* device that relies for its operation on the thermionic emission of electrons. That is, while *Barr* discloses a shaped cathode, such disclosure, without more, falls well short of a suggestion or motivation to modify the *DeCou* device to include such a cathode.

Moreover, *Barr* indicates that the cathode 16 only partially contributes to the focusing of emitted electrons and that an additional conical wall 20 is required to attain a full implementation of such functionality. Specifically, *Barr* states that “the wall part 20 is a continuation of a conical wall of the cathode chamber which converges from the emitter surface 18 to the orifice 26. This feature in combination with the focused emitter surface ensures that substantially all emitted electrons are guided to the orifice” (emphasis added). Col. 2, lines 60-65. Thus, the suggestion of the Examiner that modification of the *DeCou* device to include the emitter as configured in *Barr* will result in realization of the “full power of thermionic emissions” (emphasis added) is contrary to the clear language of *Barr*.

The foregoing thus makes clear that even if the *DeCou* device was modified to include the cathode structure of *Barr*, as the Examiner has suggested would be obvious to do, the functionality of the *DeCou* device would thereby be impaired because the *DeCou* device lacks the conical wall structure that *Barr* makes clear is necessary to achieve the focusing of “substantially all” emitted electrons. In connection with the foregoing, there is no suggestion in either reference to modify the *DeCou* device to include such a wall structure and, in fact, it was noted above that *DeCou* already implements focusing functionality. Thus, there would be no need to incorporate such a wall structure in the *DeCou* device.

For at least the foregoing reasons, Applicant respectfully submits that the Examiner has failed to make out a *prima facie* case of obviousness with respect to claim 1, as well as with respect to claims 2 and 3 depending therefrom. In particular, there is no motive or suggestion in the references to make the combination proposed by the Examiner. Moreover, even if the *DeCou* device were modified to include the *Barr* emitter, as suggested by the Examiner, the resulting combination would impair the functionality of the modified *DeCou* device. Applicant accordingly submits that the rejection of claim 1, as well as that of claims 2 and 3 depending therefrom, has been overcome and should be withdrawn.

B. Rejection of Independent Claims 5, 28, 29, 30, 44 and 53

Applicant respectfully notes that, as with the rejection posed by the Examiner concerning claim 1, the rejections of independent claims 5, 28, 29, 30, 44 and 53 are each based upon an allegedly obvious combination of the *DeCou* and *Barr* references proposed by the Examiner. The rejections of dependent claims 2 and 3, 7-9, 11-18, 31-39, 41-43, 45-52 and 54-56 are similarly based upon that combination.

As discussed above however, the obviousness rejection based upon that combination is unavailing, at least because neither *DeCou* nor *Barr* contain a suggestion or motivation to make the combination proposed by the Examiner, and because, even if the references were combined in the manner proposed by the Examiner, such a combination would impair the functionality of the modified *DeCou* device.

In view of the foregoing, Applicant respectfully submits that the rejection of independent claims 5, 28, 29, 30, 44 and 53, as well as that of dependent claims 6-18, 31-43, 45-52, and 54-56, has been overcome and should be withdrawn.

C. Rejection of Dependent Claims 4 and 19-22

While the Examiner has not explicitly stated that the rejection of dependent claims 4 and 19-22 is based upon the modification of the *DeCou* device to include the *Barr* emitter, a combination proposed by the Examiner, the Examiner has nonetheless indicated that dependent claims 4 and 19-22 stand rejected as being unpatentable over *DeCou* and *Barr* in view of *Knudsen*. In the absence of any guidance to the contrary, Applicant will assume that the combination of the *DeCou* and *Barr* references proposed by the Examiner concerning the rejection of claims 1-3, 5-18, and 28-56, as further modified by the inclusion of a non-conductive support cartridge alleged by the Examiner to be taught by *Knudsen*, forms the basis for the rejection of dependent claims 4 and 19-22.

As noted earlier herein however, the obviousness rejection based upon the combination of the *DeCou* and *Barr* references proposed by the Examiner is unavailing, at least because neither *DeCou* nor *Barr* contain a suggestion or motivation to make the combination proposed by the Examiner, and because, even if the references were combined in the manner proposed by the Examiner, such combination would impair the functionality of the modified *DeCou* device.

In view of the foregoing, Applicant respectfully submits that the rejection of dependent claim 4 and dependent claims 19-22 has been overcome and should be withdrawn.

CONCLUSION

In view of the remarks submitted herein, Applicant respectfully submits that each of the pending claims 1-22 and 28-56 are in condition for allowance. Therefore, reconsideration of the rejections is requested and allowance of those claims is respectfully solicited. In the event that the Examiner finds any remaining impediment to a prompt allowance of this application that could be clarified in a telephonic interview, the Examiner is respectfully requested to initiate the same with the undersigned attorney.

Dated this 6th day of June, 2003.

Respectfully submitted,



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